



Selecting the Right Digital Camera

The most important questions to ask when selecting a digital camera is “*what are you going to use it for?*” If you intend to just take quick snapshots for e-mail purposes then almost any camera will suit your needs. However if you plan to use it for web page photographs, or print photographs 8”x10” or larger then you have a number of factors to consider.

Pixel Density

When you start looking at digital camera specifications, pixel density becomes one of the most prominent and important factors. For example if a camera claims it has 640x480 pixel density this actual equates to 300,000 pixels. This is considered a very low resolution only used in applications that do not require printing. Potential print quality pixel densities begin when you exceed the one megapixel density. 1.3, 2.1 and 3.3 megapixel cameras are quite common now and provide a good level of quality for printing. The latter one (3.3 megapixels) is actually capable of producing good quality prints up to 11”x14”.

Pixel Density	Uses
< 1 megapixel	Web pages, powerpoint , not print
1-2 megapixels	Web pages, powerpoint, limited print
≥ 3.3 megapixels	Web, multimedia, prints

To Zoom or Not to Zoom

A digital camera with optical zoom capabilities allows you to be more creative with your composition. People who enjoy nature, sports, and/or portrait photography should consider having zoom capabilities.

Generally zoom capable cameras cost significantly more than a fixed focal length or digital zoom capable cameras. The difference between optical and digital zoom is significant. An optical zoom lens is what you typically understand as a zoom lens using optics to bring the image closer with no reduction in resolution (i.e. picture quality). The lens will typically move in and out to increase or decrease the focal length.

On the other hand a digital zoom is not a real zoom. It simply zooms in on the CCD sensor that captures the image in the camera showing a smaller portion of the sensor. This reduces the number of pixels overall in the captured picture, thus reducing the resolution (i.e. quality) of the picture. Digital zooms use software interpolation to add more pixels to the image; however, simply not zooming and then cropping the picture using appropriate software on the computer can obtain the same quality. Generally avoid cameras with digital zoom only capabilities.

Floppies, Smartcards, Memory Sticks, Microdrives!!??

One of the most important considerations in selecting a digital camera is sometimes not even considered by consumers in their purchase, that is what media for storage is the camera using. Each has their own advantages and disadvantages.



Type	Size	Uses
Floppies	1.44Mb	Ideal for sharing among multiple users like in a school setting. Users can simply take all their pictures on a floppy, take out the diskette and then hand it to another user. Very inexpensive but will not store high quality images due to the small storage capacity. Used in the Sony Mavica.
SmartMedia (Compact Flash memory)	4-64Mb	Small wafer thin high density cards. Used in a number of mid-range cameras and ideal for small form factor ones due to their size. Fairly expensive media but allows for a large number of low or high resolution photos depending on the size of card purchased. Used in many Fuji cameras.
Memory Stick (Flash memory)	8-64Mb	Similar to the Smartcards but in the form of an elongated stick approximately the size of a stick of gum. Again it has similar advantages and disadvantages as the smartcard. This is an exclusive product of Sony for their higher resolution products.
IBM Microdrives (Mini hard drive)	340Mb, 1Gb	By far the highest capacity media you can buy. This media allows you to store literally hundreds of high-resolution photographs. Used in many mid to high-end cameras (e.g. Canon S20, Fuji FinePix S1 Pro). Generally if you want to take a number of print quality photographs this is the best price per megabyte solution.

There are still some cameras on the market that have no removable media. That is you have to connect it to a computer and download the pictures before you can re-use it to take more pictures. Do not purchase this kind of camera as they are very limited.

The capacity of the storage media determines the quantity and quality of the pictures you take in a single session. If to tend to take very few low resolution photos then a floppy may be enough. If, however, you want to take many (e.g. over 100) printable photographs, then you need to consider higher capacity storage like smart cards or microdrives. Generally I prefer microdrives because they are the most cost effective with a 340 Mb Microdrive costing approximately \$550. If you bought ten 32 Mb Smartcards totally 320Mb the cost would be \$1800. Note that the 1 Gb Microdrive is the most cost effective at \$660. The equivalent cost in smartmedia would be \$4500.

Computer Connectivity

Another consideration is how you move the picture from the camera to the computer. The simplest method by far is the floppy diskette, simply take the floppy out of the camera and put it in the computer. For all other media it gets more complex.

Type	Explanation
Direct connect	Many cameras provide you with a direct connect capability from the camera to the computer, either through a standard serial, parallel or USB port. Generally USB connectivity is better because it has the greatest bandwidth (transfer rate).
Intermediary device	Many cameras provide a device to connect to the computer, which will accept the removable media. You leave the device attached to your computer and you insert your removable media for transfer to the computer. Again USB is the preferable connection method.

Type	Explanation
Multiconnect options	A few cameras not only have multiple media options but also multiple connect options. For example the Canon S20 can directly connect using USB, or you can use the PCMCIA adapter to put the microdrive into a notebook PCMCIA slot, or you can purchase an external microdrive reader which attaches to your desktop.

Batteries

Another consideration is the kind of battery supplied with the camera. If the camera accepts only alkaline batteries the cost of batteries over the life of the camera will be more than the camera itself.

Type	Explanation
Alkaline	Do not purchase a camera that only uses alkaline batteries
Nickel Cadmium (NiCad)	NiCad batteries where the first rechargeable batteries made and are known for what is termed memory build-up. That is you must constantly drain the batteries fully before recharging or it will only sustain a partial charge. Over time the battery will not function. DO NOT purchase a camera, which has NiCad batteries.
Nickel Metal Hydride	Nickel Metal Hydride batteries significantly improved rechargeable batteries by reducing the amount of memory build-up created by partial discharges as well as increasing the charge life of the battery. Cameras with Nickel Metal Hydride batteries are worth considering.
Lithium Ion	Lithium Ion batteries are the new standard in rechargeable battery technology. With longer life than Nickel Metal and reduced memory build-up it provides the best results for all users. If you plan to take a large number of pictures in one session or mostly indoor photographs using the built-in flash then you must consider this kind of battery.

Software Included

An important consideration in the purchase of a camera is the software included. Generally most will include some kind of photo editing software. In the more expensive cameras a limited version of Adobe Photoshop is included, which, if you don't plan to purchase the full version is your best choice. Although there are other photo-editing software packages on the market, I feel that Adobe Photoshop is by far the best.

Physical Size

The physical size of the camera may affect your selection due to a number of reasons. If you want a camera that is always in your pocket ready to take pictures then a smaller form factor would be important. Also the weight of the camera would be important. Cameras such as the Fuji FinePix 4700 would fit nicely into a shirt pocket and provides zoom and high resolution photographs. The only real disadvantage to this kind of camera deals with the quality of the optics. The general rule is, the larger the optics the better the light capturing capability thus improving image quality. Cameras such as the Fuji FinePix 4900 or the Sony DSC-F505V Cybershot have much larger lens elements and take very good quality photographs.

	
Sony DSC-F505V	Fuji FinePix 4900

Other Features

LCD Preview/Viewfinder Screen

This is almost a standard on all digital cameras now allowing you to preview pictures you have taken or even frame pictures using the LCD screen instead of the standard viewfinder. If the camera doesn't have a LCD

screen then you shouldn't buy it. Note also that the LCD screen uses a great deal of power and will drain your battery faster if it is used often.

Multiple Exposure Settings

Most digital cameras have different settings that change the exposure like standard 35mm compact cameras. For example they may have portrait, indoor, sports and landscape settings and the appropriate aperture and shutter speeds would be selected. Only high-end cameras typically have full manual controls allowing you to set the aperture and shutter speeds yourself.

Autofocus

Some digital cameras use what is called fixed focus lenses. This means they stay in focus from a certain distance to infinity. This means there is very limited exposure control as well because aperture adjustments affect the depth of field (of focus) hence a fixed focus lens also has a fixed aperture. Only buy cameras with autofocus capabilities.

Brand Name

Although this may seem minor certain brand names have become leaders in the digital camera market as well as being leaders in either the photography or computer industry. Generally try to select cameras with recognized brand names. For example, Fuji, Sony, Canon, Hewlett-Packard, Nikon, Olympus, and Kodak are some of the best companies in this industry.

Recommendations

The following are recommendations based on quality, features, price and brand names. There are a large number because each has different features for different kinds of photographic needs. One of the best places to go see digital cameras is Henry's Camera Store with locations in North Toronto, Mississauga and downtown Toronto. Their web site is <http://www.henrys.com>. Note that all prices are in Canadian dollars and are accurate as of **January 28, 2001.**

Low End – Minimum Entry Level	
	
Fuji FinePix 1400 - \$600	Kodak DC-3400 - \$650
	
Olympus D460 - \$600	Sony Mavica FD73 - \$700
Mid-Range – Good Entry to Average Amateur	
	
Fuji FinePix 4700 - \$1100	Canon S-20 - \$1100
	
Kodak DC4800 - \$950	Nikon CoolPix 880 - \$1100
High End – Good Amateur to Professional	
	
Fuji FinePix 4900 - \$1500	Nikon CoolPix 990 - \$1400
	
Sony DSC S70 - \$1500	Sony DSC F505V - \$1700

Professional Only	
	
Fuji FinePix S1 Pro - \$5300	Canon EOS D30 - \$4400

Recommended Computer Configuration

One of the keys to having a good experience with your digital camera is to have a good computer to do your editing. Since I am recommending Adobe Photoshop as your main photo-editing tool, the hardware below reflects what will run this application well. The general rule when assessing/purchasing a computer to work with your digital camera is, the better the digital camera the better your computer. A low-end camera creates smaller files that are easier to manipulate thus a less powerful computer is required. Conversely a high-end camera produces much larger files, which requires a more powerful computer. Note as well that your files get significantly larger as you enlarge and/or combine several photographs.

The following hardware is recommended, prices are in Canadian dollars and are accurate as of **January 28, 2001:**

Good Hardware	
IBM-PC Compatible	Macintosh
Intel Pentium III-800EB MHz 128 Mb SDRAM 2x 30Gb Hard Drives DVD-ROM drive 17" Monitor Windows ME \$2000	iMac DV Special Edition 500 MHz G3 processor 128 Mb RAM 30 Gb Hard Drive DVD-ROM drive 15" Monitor Built in System 9 \$2300

Better Hardware	
IBM-PC Compatible	Macintosh
Dual Intel Pentium III-933EB MHz 256 Mb DDR-SDRAM 4x 30Gb Hard Drives DVD-ROM drive CD-RW drive Floppy Drive 250Mb Zip Drive 64 Mb Graphics card (ATI Radeon) 4 point surround sound with subwoofer (Cambridge Soundworks) 19" Monitor (Viewsonic G90m) Full Tower Case Windows 2000 \$5100	PowerMac PowerPC-G4 667 MHz 256 Mb RAM 1x 60 Gb Hard Drive 1x 40 Gb Hard Drive CD-RW drive No Floppy Drive 250Mb Zip Drive 32 Mb Graphics Card (ATI Radeon) Apple Pro speakers (2 speaker no subwoofer) 17" Apple Display CRT System 9 \$5600

Recommended Printer

If you intend to print your pictures then it is critical to have a good quality printer. There are only two brands that I recommend (Hewlett-Packard and Epson) but within these brands there are several models to choose from. The key is to only pick a model with some kind of photo resolution enhancement technology. The following are excellent printers. The Good Entry level printers print up to legal size prints while the Recommended are capable of printing up to 13" x 19" tabloid size.

When going to look at printers check to see how much ink cartridge replacements cost. They are not cheap. If you print many full-page photographs you can use up your ink very quickly. Always have spare cartridges on hand.

Note: Of the four printers listed the best in my opinion is the Hewlett-Packard 1220 in terms of price, quality and performance.

Good Entry Level	
	
Hewlett Packard Deskjet 932 \$300	Epson Stylus Colour 880 \$200
Photo Resolution Enhancement Photo REt III 2400x1200dpi	Micro Piezo Ink technology 2880x720 dpi

Recommended (Tabloid Capable)	
	
Hewlett Packard Deskjet 1220 *** \$700 ***	Epson Stylus Photo 2000P \$1500
Photo Resolution Enhancement Photo REt III 2400x1200dpi	Micro Piezo Ink technology 1440x720 dpi

Print Paper

The last item when getting into digital print photography is to select the type of paper you plan to use. You can simply use plain paper or select one of the many different specialty papers. The question is

“Does it really make a difference?”

In a word **“YES”**. The quality of paper with one of the above printers makes all the difference. There are different levels of quality from simply bright white paper

with a smooth finish to photographic weight glossy paper. The following is a list of recommended paper:

Type	Description
	Epson Photo Quality, Bright White Glossy, medium weight 100 sheets \$22
	Epson Matte, Heavy Weight, Bright White 50 sheets \$20
	Epson Photo Glossy Paper, Bright White, Heavy Weight 20 sheets \$20
	Hewlett-Packard Premium Plus Photo Paper, Glossy, Heavy Weight 20 Sheets \$24
	Kodak Picture Paper, Glossy, Heavy Weight 15 Sheets \$15